

## **COMPLETE SET OF PENDING CLAIMS**

1. A radiation monitor comprising:
  - (a) a first chamber comprising:
    - a first electrically conductive housing having walls defining an internal volume of space;
    - at least one hole through a cap of the first housing for permitting entry of ambient air into the internal volume of space; and
    - a first solid state nuclear track detector (SSNTD) disposed within the first housing with a first thin electrically conducting cover;
  - (b) a second chamber comprising:
    - a second electrically conductive housing having walls defining an internal volume of space;
    - at least one hole through a cap of the second housing for permitting entry of ambient air into the internal volume of space of the second housing;
    - a second solid state nuclear track detector (SSNTD) disposed within the second housing with a second thin electrically conducting cover; and
    - a diffusion barrier within the second housing;
    - wherein the second solid state nuclear track detector (SSNTD) is generally isolated from radiation in the internal volume of space of the second housing;
  - (c) a third chamber comprising:
    - a third electrically conductive housing having walls defining an internal volume of space;

at least one hole through a cap of the third housing for permitting entry of ambient air into the internal volume of space of the third housing;

a third solid state nuclear track detector (SSNTD) disposed within the third housing with a third thin electrically conducting cover;

a diffusion barrier within the third housing;

wherein the third solid state nuclear track detector (SSNTD) is generally isolated from radiation in the internal volume of space of the third housing.

2. The monitor of claim 1 wherein the second chamber further comprises a seal around the diffusion barrier for generally isolating the second solid state nuclear track detector (SSNTD) from thoron radiation in the internal volume of space of the second housing.

3. The monitor of claim 2 wherein the seal is an O-ring seal.

4. The monitor of claim 2 wherein the second chamber further comprises an O-shaped insert for holding the seal in place.

5. The monitor of claim 1 wherein the third chamber further comprises a seal around the diffusion barrier for generally isolating the third solid state nuclear track detector (SSNTD) from thoron radiation in the internal volume of space of the third housing.

6. The monitor of claim 5 wherein the seal is an O-ring seal.

7. The monitor of claim 5 wherein the third chamber further comprises an O-shaped insert for holding the seal in place.

8. The monitor of claim 1 further comprising a fastening portion provided on one of the first housing, the second housing and the third housing.

9. The monitor of claim 1 wherein there is generally no electrical charge present on the radiation monitor.

10. The monitor of claim 1 wherein the first, second and third chambers are arranged in a trilobed manner.

11. The monitor of claim 1 wherein the first housing, the second housing and the third housing are cylindrically shaped.

12. The monitor of claim 1 wherein each of the first housing, the second housing and the third housing is made from an electrically conductive material that shields the inside of the housing from radiation.

13. The monitor of claim 1 wherein the first housing, the second housing and the third housing are molded from conducting plastic with embedded nickel coated carbon fibers.

14. The monitor of claim 1 wherein each of the first SSNTD, the second SSNTD and the third SSNTD further comprises a solid state nuclear track film.

15. The monitor of claim 1 wherein each of the first SSNTD, the second SSNTD and the third SSNTD further comprises a solid state nuclear track film made of allyl diglycol carbonate.

16. The monitor of claim 1 wherein each of the first SSNTD, the second SSNTD and the third SSNTD further comprises a solid state nuclear track film made of cellulose acetate.

17. The monitor of claim 1 wherein each of the second chamber and the third chamber further comprises a conducting foam for generally preventing entry of dust therein.

18. The monitor of claim 1 further comprising:

(a) a fourth chamber comprising:

a fourth electrically conductive housing having walls defining an internal volume of space;

at least one hole through a cap of the fourth housing for permitting entry of ambient air into the internal volume of space; and

a fourth solid state nuclear track detector (SSNTD) disposed within the fourth housing with a fourth thin electrically conducting cover.

19. The monitor of claim 18 further comprising a fastening portion and an additional fastening portion respectively provided on two of the first housing, the second housing, the third housing and the fourth housing.

20. The monitor of claim 18 further comprising a fastening portion provided on one of the first housing, the second housing, the third housing and fourth housing.

21. The monitor of claim 18 wherein there is generally no electrical charge present on the radiation monitor.

22. The monitor of claim 18 wherein the first, second, third and fourth chambers are arranged in a four-lobe manner.

23. The monitor of claim 18 wherein the first housing, the second housing, the third housing and the fourth housing are cylindrically shaped.

24. The monitor of claim 18 wherein each of the first housing, the second housing, the third housing and the fourth housing is made from an electrically conductive material that shields the inside of the housing from radiation.

25. The monitor of claim 18 wherein the first housing, the second housing, the third housing and the fourth housing are molded from conducting plastic with embedded nickel coated carbon fibers.

26. The monitor of claim 18 wherein each of the first SSNTD, the second SSNTD, the third SSNTD and the fourth SSNTD further comprises a solid state nuclear track film.

27. The monitor of claim 18 wherein each of the first SSNTD, the second SSNTD, the third SSNTD and the fourth SSNTD further comprises a solid state nuclear track film made of allyl diglycol carbonate.

28. The monitor of claim 18 wherein each of the first SSNTD, the second SSNTD, the third SSNTD and the fourth SSNTD further comprises a solid state nuclear track film made of cellulose acetate.

29. The monitor of claim 18 wherein each of the second chamber and the third chamber further comprises a conducting foam for generally preventing entry of dust therein.

30. The monitor of claim 18 wherein the first chamber and the second chamber comprise a first chamber pair for monitoring radiation and providing radiation measurement data; and

the third chamber and the fourth chamber comprise a second chamber pair for monitoring radiation and providing radiation measurement data;

wherein radiation measurement data uncertainty is calculated based on the measurement data provided by the first and second chamber pairs.